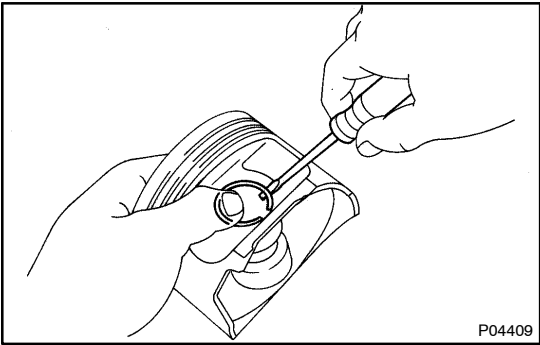


REASSEMBLY

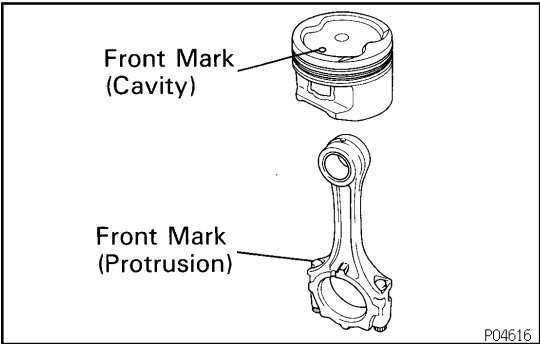
HINT:

- Thoroughly clean all parts to be assembled.
- Before installing the parts, apply new engine oil to all sliding and rotating surfaces.
- Replace all gaskets, O-rings and oil seals with new parts.

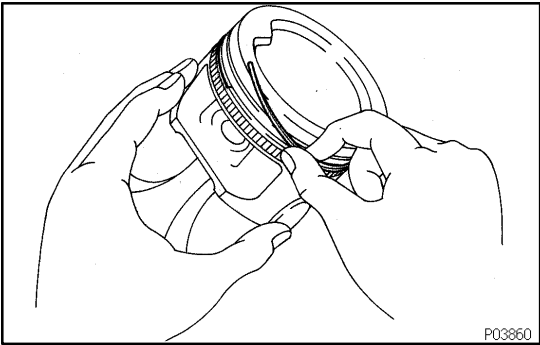


1. ASSEMBLE PISTON AND CONNECTING ROD

- (a) Install a new snap ring on one side of the piston pin hole.
(b) Gradually heat the piston to 80 – 90°C (176 – 194°F).

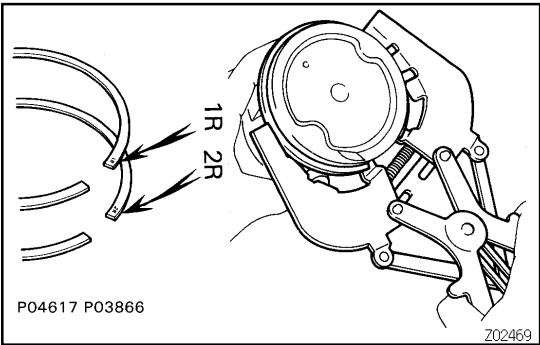


- (c) Coat the piston pin with engine oil.
(d) Align the front marks of the piston and connecting rod, and push in the piston pin with your thumb.
(e) Install a new snap ring on the other side of the piston pin hole.



2. INSTALL PISTON RINGS

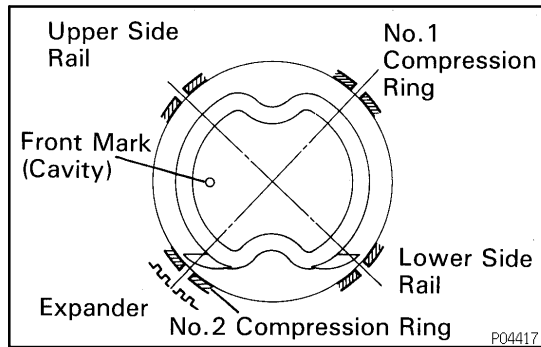
- (a) Install the oil ring expander and 2 side rails by hand.



- (b) Using a piston ring expander, install the 2 compression rings with the code mark facing upward.

Code mark:

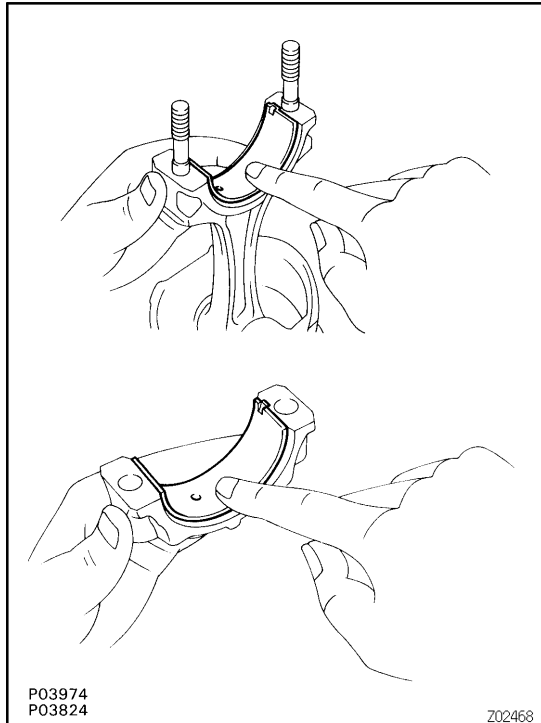
No. 1	1R
No. 2	2R



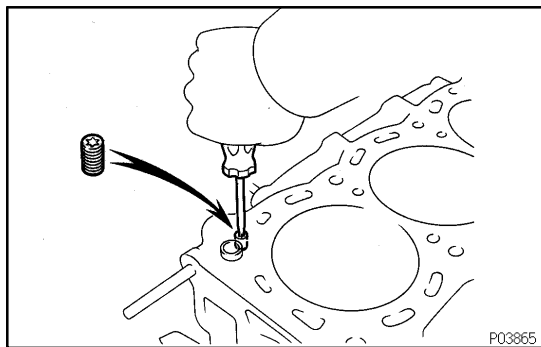
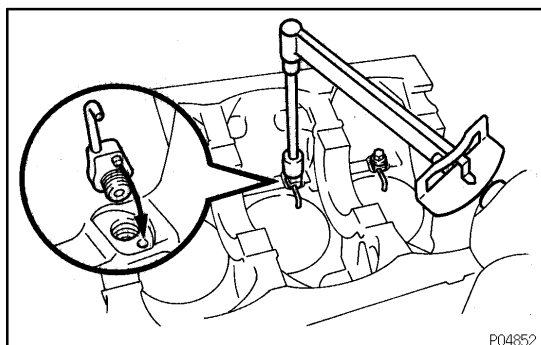
- (c) Position the piston rings so that the ring ends are as shown.

NOTICE:

Do not align the ring ends.

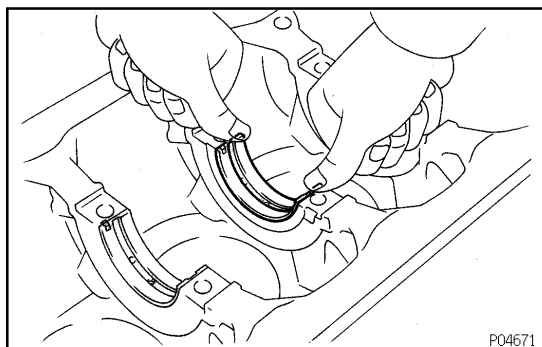
**3. INSTALL BEARINGS**

- (a) Align the bearing claw with the groove of the connecting rod or connecting rod cap.
- (b) Install the bearings in the connecting rod and connecting rod cap.

**4. INSTALL CYLINDER BLOCK ORIFICE****5. INSTALL OIL NOZZLES AND CHECK VALVES**

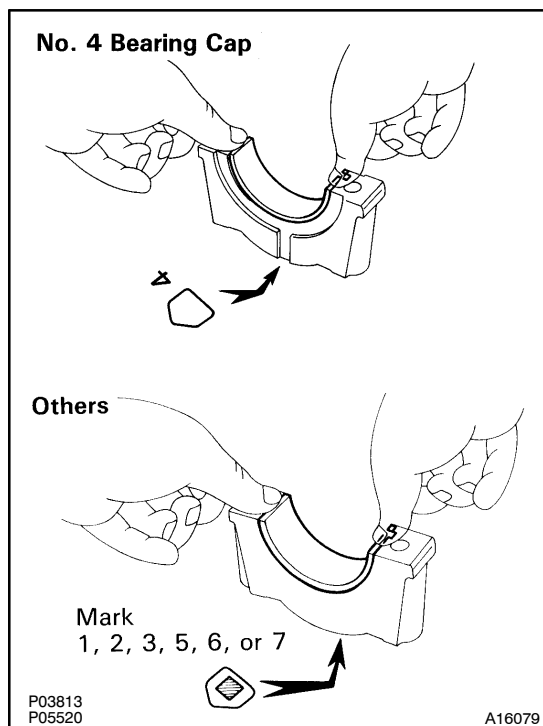
- (a) Align the pin of the oil nozzle with the pin hole of the cylinder block.
- (b) Install the oil nozzle with the check valve. Install the 6 oil nozzles and check valves.

Torque: 25 N·m (250 kgf·cm, 18 ft·lbf)



6. INSTALL MAIN BEARINGS

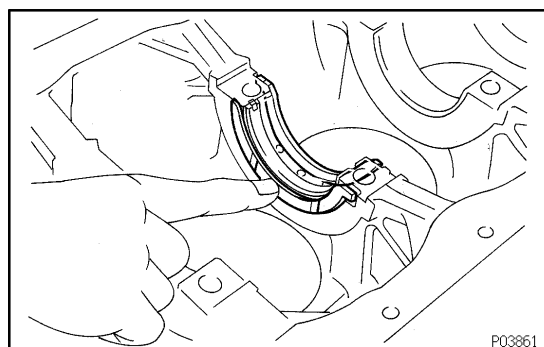
- (a) Align the bearing claw with the claw groove of the cylinder block, and push in the 7 upper bearings.



- (b) Align the bearing claw with the claw groove of the main bearing cap, and push in the 7 lower bearings.

HINT:

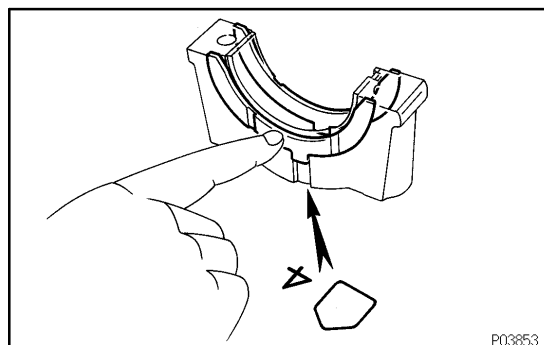
A number is marked on each main bearing cap to indicate the installation position.



7. INSTALL UPPER THRUST WASHERS

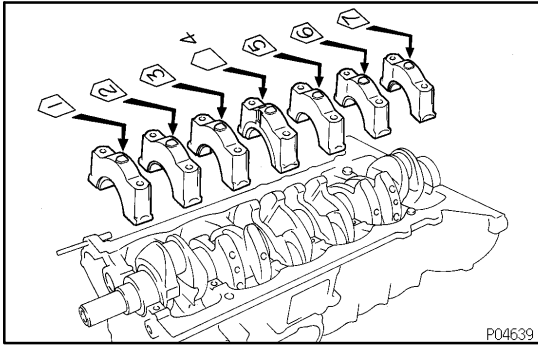
Install the 2 thrust washers under the No.4 journal position of the cylinder block with the oil grooves facing outward.

8. PLACE CRANKSHAFT ON CYLINDER BLOCK



9. INSTALL MAIN BEARING CAPS AND LOWER THRUST WASHERS

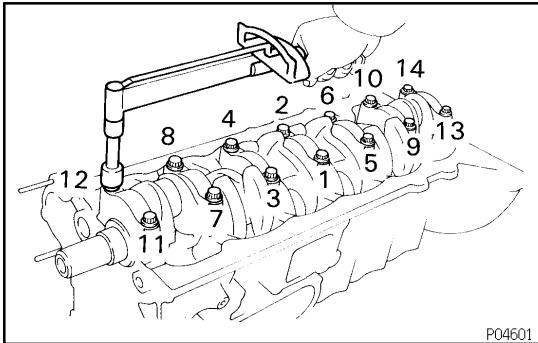
- (a) Place the main bearing caps and lower thrust washers on the cylinder block.
- (1) Install the 2 thrust washers on the No.4 bearing cap with the grooves facing outward.



- (2) Install the 7 main bearing caps in their proper locations.

HINT:

Each bearing cap has a number and front mark.



- (b) Install the main bearing cap bolts.

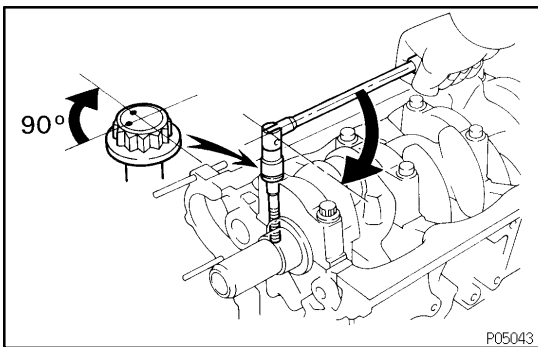
HINT:

- The main bearing cap bolts are tightened in 2 progressive steps (steps (b) and (d)).
- If any of the main bearing cap bolts is broken or deformed, replace it.

- (1) Apply a light coat of engine oil on the threads and under the heads of the main bearings cap bolts.
- (2) Install and uniformly tighten the 14 bolts of the main bearing caps, in several passes, in the sequence shown.

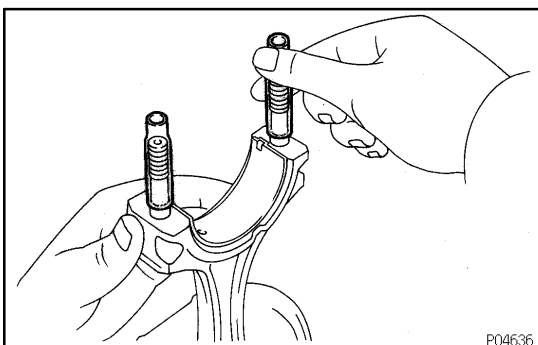
Torque: 74 N·m (750 kgf·cm, 54 ft·lbf)

If any one of the main bearing cap bolts does not meet the torque specification, replace the main bearing cap bolt.



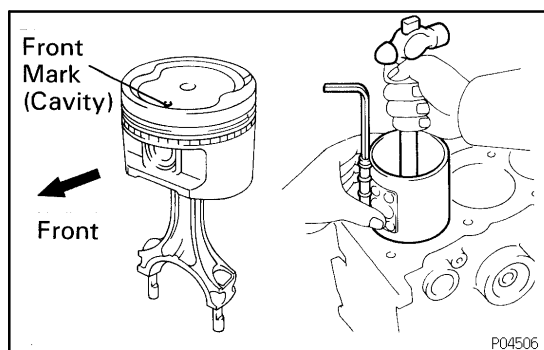
- (3) Mark the front of the main bearing cap bolt with paint.
- (4) Retighten the main bearing cap bolts by 90° in the numerical order shown above.
- (5) Check that the painted mark is now at a 90° angle to the front.

- (c) Check that the crankshaft turns smoothly.
- (d) Check that the crankshaft thrust clearance (See page [EM-83](#)).

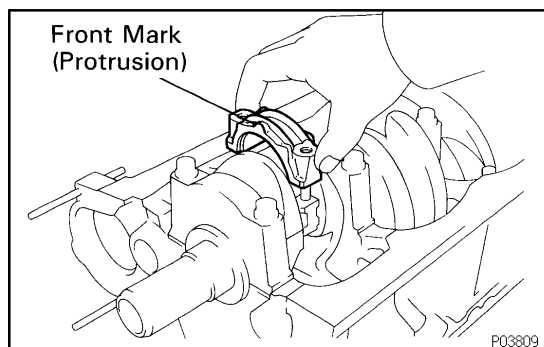


10. INSTALL PISTON AND CONNECTING ROD ASSEMBLIES

- (a) Cover the connecting rod bolts with a short piece of hose to protect the crankshaft from damage.

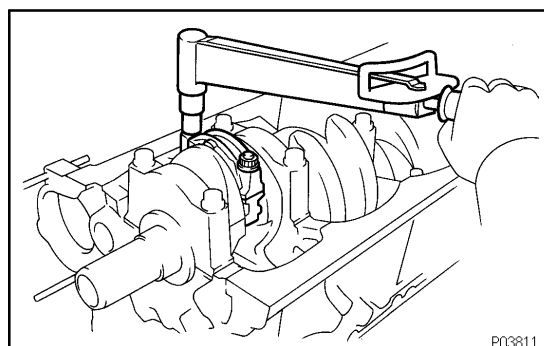


- (b) Using a piston ring compressor, push the correctly numbered piston and connecting rod assemblies into each cylinder with the front mark of the piston facing forward.



11. INSTALL CONNECTING ROD CAP

- (a) Place the connecting rod cap on the connecting rod.
- (1) Match the numbered connecting rod cap with the connecting rod.
 - (2) Install the connecting rod cap with the front mark facing forward.



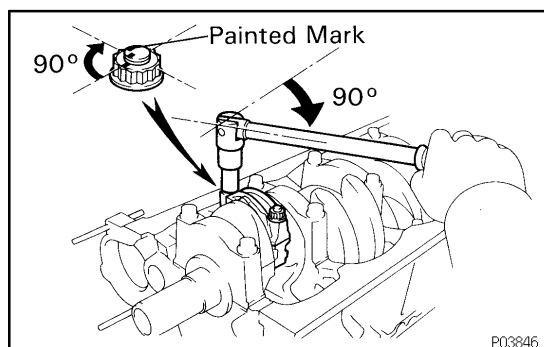
- (b) Install the connecting rod cap nuts.

HINT:

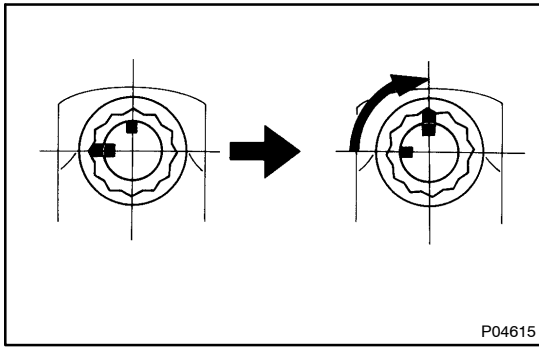
- The connecting rod cap nuts are tightened in 2 progressive steps (steps (b) and (d)).
 - If any connecting rod bolt is broken or deformed, replace it.
- (1) Apply a light coat of engine oil on the threads and under the nuts of the connecting rod cap.
 - (2) Install and alternately tighten the nuts of the connecting rod cap in several passes.

Torque: 48 N·m (490 kgf·cm, 35 ft·lbf)

If any one of the connecting rod cap nuts does not meet the torque specification, replace the connecting rod bolt and cap nut as a set.



- (3) Mark the front of the connecting rod cap nut and bolt with paint.
- (4) Retighten the connecting rod cap nuts 90° as shown.

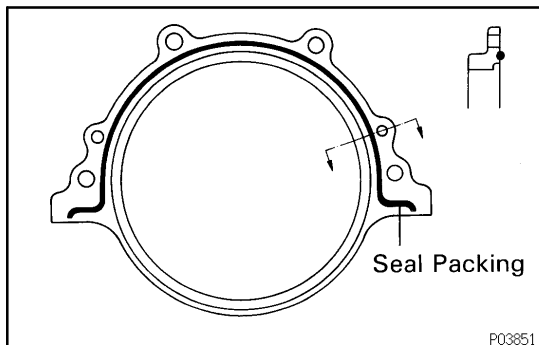


(5) Check that the painted mark on the nut is at 90° angle in relation to the mark on the bolt.

- (c) Check that the crankshaft turns smoothly.
- (d) Check that the connecting rod thrust clearance (See page [EM-83](#)).

12. INSTALL REAR OIL SEAL RETAINER

- (a) Remove any old packing (FIPG) material and be careful not to drop any oil on the contact surfaces of the retainer and cylinder block.
 - Using a razor blade and gasket scraper, remove all the old packing (FIPG) material from the gasket surfaces and sealing groove.
 - Thoroughly clean all components to remove all the loose material.
 - Using a non-residue solvent, clean both sealing surfaces.



- (b) Apply seal packing to the retainer as shown in the illustration.

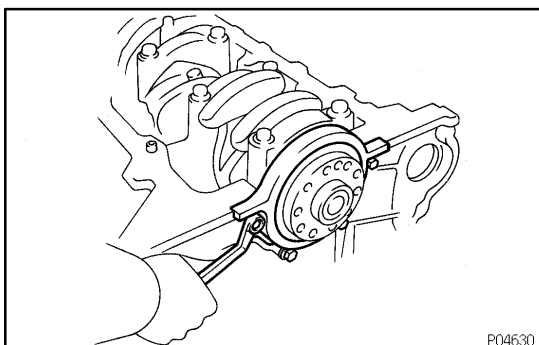
Seal packing: Part No. 08826-00080 or equivalent

- Install a nozzle that has been cut to a 2 – 3 mm (0.08 – 0.12 in.) opening.

HINT:

Avoid applying an excessive amount to the surface.

- Parts must be assembled within 5 minutes of application. Otherwise the material must be removed and reapplied.
- Immediately remove nozzle from the tube and reinstall cap.



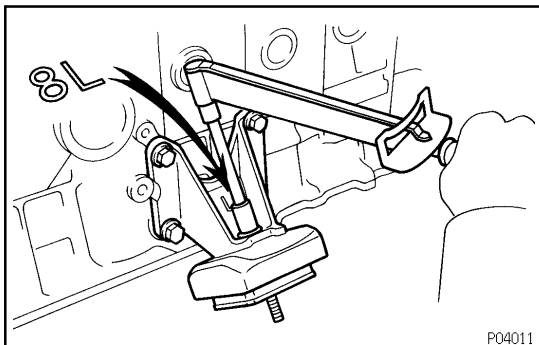
- (c) Install the retainer with the 4 bolts.

Torque: 21 N·m (210 kgf·cm, 15 ft·lbf)

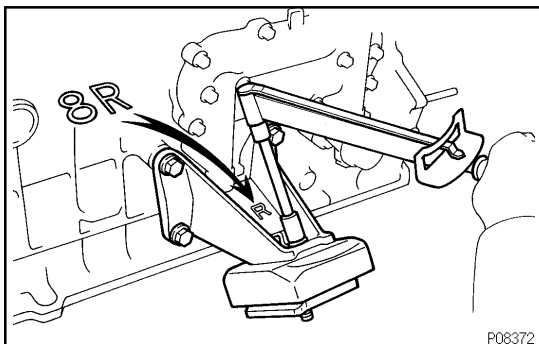
13. INSTALL OIL COOLER COVER AND OIL COOLER

Install a new gasket, the oil cooler cover and oil cooler with the 10 bolts and 2 nuts.

Torque: 21 N·m (210 kgf·cm, 15 ft·lbf)

**14. INSTALL LH ENGINE MOUNTING BRACKET**

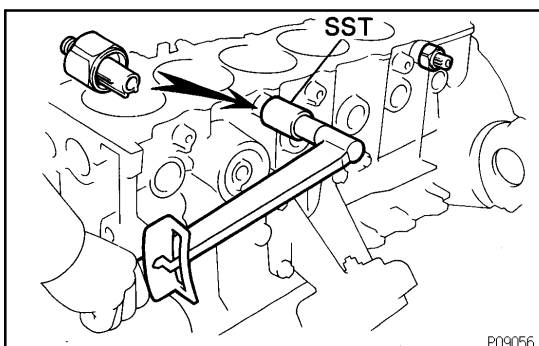
- (a) Install the bracket with the 4 bolts.
Torque: 69 N·m (700 kgf·cm, 51 ft·lbf)
- (b) Install the insulator with the nut.
Torque: 72 N·m (730 kgf·cm, 43 ft·lbf)

**15. INSTALL RH ENGINE MOUNTING BRACKET**

- (a) Install the bracket with the 4 bolts.
Torque: 69 N·m (700 kgf·cm, 51 ft·lbf)
- (b) Install the insulator with the nut.
Torque: 72 N·m (730 kgf·cm, 43 ft·lbf)

16. INSTALL PS PUMP

- (a) Place a new O-ring to the pump.
- (b) Install the pump with the 2 nuts.
Torque: 36 N·m (370 kgf·cm, 27 ft·lbf)

**17. INSTALL KNOCK SENSORS**

Using SST, install the 2 knock sensors.

SST 09816-30010

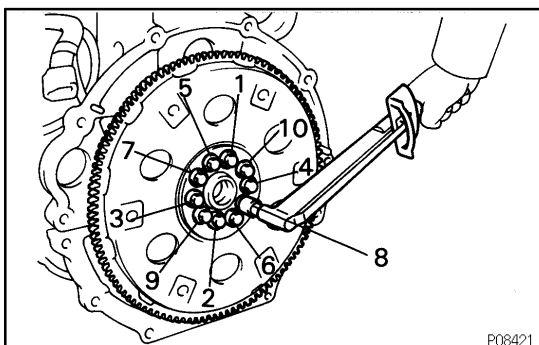
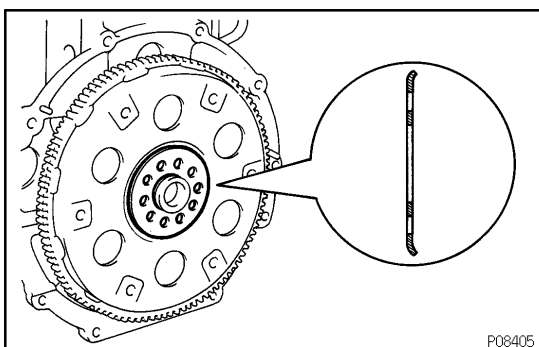
Torque: 44 N·m (450 kgf·cm, 33 ft·lbf)

18. INSTALL OIL FILTER UNION

Torque: 44 N·m (450 kgf·cm, 33 ft·lbf)

19. INSTALL OIL FILTER (See page [LU-2](#))**20. INSTALL TIMING CHAIN (See page [EM-19](#))****21. INSTALL CYLINDER HEAD (See page [EM-54](#))****22. REMOVE ENGINE STAND****23. INSTALL DRIVE PLATE**

- (a) Install the front spacer, drive plate and rear plate on the crankshaft.



- (b) Install and uniformly tighten the 10 drive plate bolts, in several passes, in the sequence shown.
Torque: 100 N·m (1,000 kgf·cm, 74 ft·lbf)